

UROLOGY

SUMMARY

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VISIT...

LANZAROTE
Caliente.COM

I- **UNDESCENDED TESTIS** :-

* Incidence :-

- about 1% of males ($\uparrow$ in premature infants)
- Defined : as arrest in normal pathway of descend.
- More in Rt side, 20% bilateral (Cryptorchidism) (hidden testis)
_{50%}

* Aetiology :-

- ① Hormonal :- (Bilateral cases) :- due to $\downarrow$ HCG ^{testosterone} [$\downarrow$ androgen] _{or receptor not respond} so $\uparrow$ premature.
(the placental HCG secreted more in last week pregnancy)
- ② Mechanical :- (more in Unilateral) (anatomical causes) : as :-
 - Short gubernaculum (atrophied)
 - Short spermatic cord & vessels.
 - Stricture or stenosis of inguinal canal.

* Pathology :-

- the testis arrest anywhere along normal pathway $\rightarrow$ intraabdominal, in inguinal canal, superficial ring or neck of scrotum.

* Complications :-

(subfertility $\rightarrow$ unil)

$\rightarrow$ 3T tumour, torsion, trauma

- | | |
|--|--|
| ① - sterility (if bilateral) | ④ - associated indirect ing. hernia (^{90%} 75% of pt) |
| ② - $\uparrow$ torsion testis _{15 times} | ⑤ - recurrent trauma (if inguinal) $\rightarrow$ atrophy. |
| ③ - $\uparrow$ malignancy risk _{35%} 50%
(even after orchidopexy)
(more high testis $\rightarrow$ $\uparrow$ risk of malign.) | ⑥ - psychiatric disturbance. |
| | ⑦ - infection (NB orchitis always viral)
(epididymo-orchitis) |

* Clinical Picture :-

- Empty ^{undeveloped} scrotum (uni- or biL) discovered by neonatal exam. or by mother.

NB: superficial ing. pouch :- is a pocket between Scarpa's fascia (deep membranous layer) & ext. oblique aponeurosis, adjacent to external ring. a common site for ectopic testis.

* D/D of empty scrotum :-

- ① ectopic testis
- ② undescended testis
- ③ retractile testis
- ④ testis agenesis.
- ⑤ surgically removed (orchidectomy).
- ⑥ herma-phroditism. (in bil. cases).
(intersex)

* Investigations :-

- 1) Hormonal assay (specially if bilateral with hypospadias) → LH, testosterone.
- 2) U/S, CT, MRI to localize testis if impalpable "pseudoherniaphroditism"
esp. in epispadias
- 3) laparoscopy if intraabdominal → may be Dx + operative.
- angiography

* Treatment :-

- If testis do not descend within 6 months age unlikely to descend alone so do surgery before 1 yr age (after 2 yr → degenerated testis).

① Hormonal ttt :- by HCG → given for bilateral cases & if testis descend give small dose HCG [if testosterone ↑ means good prognosis] and give small dose testosterone to refresh testis, elongate cord & ↑ fertility (some do not recommend hormonal) (success rate vs surgery is 25%).

② Surgery :- "Orchidopexy" [standard ttt]. better done after 6 months
→ in dartos pouch (bet skin & dartos).
- fixation of testis to scrotum. (through inguinal incision).
- if very high do staged orchidopexy (some do not recommend staged orch. bec. post-operative fibrosis).
- If old neglected case → (>12 y) do orchidectomy.
some try to do orchidopexy if failed → orchidectomy
if pt refuse orchidectomy → do orchidopexy [to diagnose changes as malignancy easily]

NB - Indication of orchidopexy :-

success: 95%

- 1 - failed hormonal ttt.
- 2 - ectopic testis (when baby reach 6 months age).
- 3 - associated inguinal hernia.

NB :- orchidopexy does not ↓ risk of malignancy but early detection can be.

hormonal ttt done at 6m - especially if testis near to scrotum also to facilitate descend.

II - ECTOPIC TESTIS :-

* Definition:- arrest of testis outside normal pathway. [after passing ^{artery & vein} superf. ring]

* Aetiology:- may be caused by pull of an accessory gubernaculum.

- ectopic sites are
- 1) superficial ing. pouch → commonest site.
- above & lat. to pubic tubercle.
- subcutaneous
 - 2) root of penis.
 - 3) femoral Δ.
 - 4) perineum (bet. anus & scrotum) → Painful on sitting.
 - 5) suprapubic area.
 - 6) contralateral scrotal compartment.

* Treatment:- orchidopexy or orchidectomy [no hormonal ttt].

III - RETRACTILE TESTIS :-

- Occurs in young children due to exaggerated cremastic reflex.
- It is not a disease as testis has descended normally to scrotum.
- Differentiated from undescended testis as the scrotum here is well developed & sometimes contains testis e.g in squatting position "chair test" or "milking test".

* Types:- ① low retractile:- most of time testis at neck of scrotum

- when drawn down to scrotum by milking test it stay there.

② high retractile:- most of time in ing. canal (or ext. ring).

- when drawn by milking doesn't stay (return)

NB:- cremastic muscle is not well developed in first 3 months of life so no retractile testis under 3 months of age
retractile testis never occurs after puberty.

* Treatment:-

- usually no ttt as testis becomes heavier → not retractile
- Orchidopexy is done if ① high retractile ② small (atrophied) testis.

THE SCROTUM

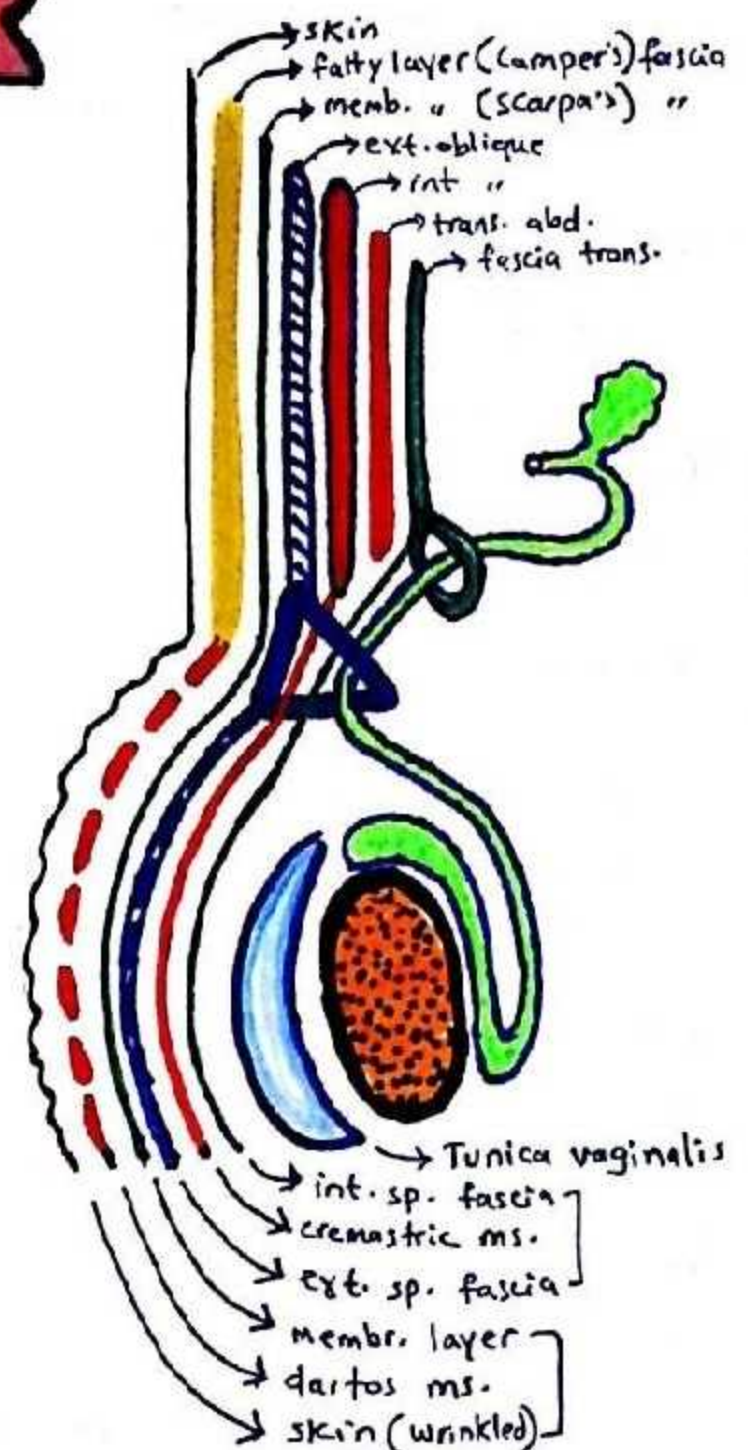
* ANATOMY :-

- the scrotum has the following layers:-

- 1- skin → wrinkled.
- 2- dartos ms. (replace fatty layer)
- 3- membr. layer (contin. of scarp's fascia)
- 4- ext. spermatic fascia (" " ext. oblique)
- 5- cremasteric ms (from int. oblique).
- 6- int. sp. fascia (from fascia transv.).
- 7- tunica vaginalis (Parietal & visceral layer)

- Cremasteric ms is supplied by genital br. of genitofemoral N. (L1,2).

- dartos ms is smooth muscle (autonomic N)



SCROTAL SWELLING

* Definition:- increase scrotal size due to ↑ it's content size. or fluid.

* Causes D/D:-

- 1- hydrocele
- 2- spermatocele
- 3- ^{simple} epididymal cyst

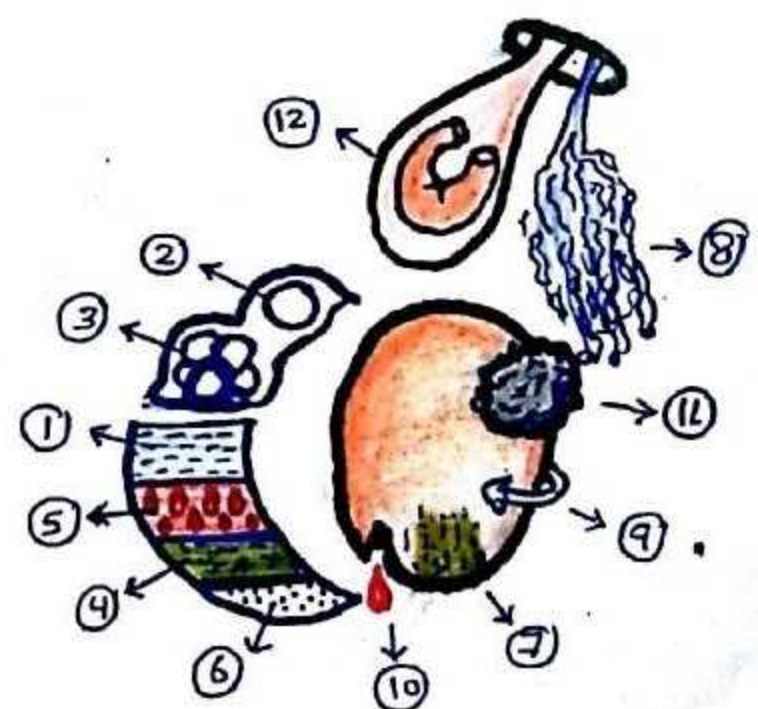
Painless

- 4- pyocele
- 5- hematocele
- 6- chylocele
- 7- infection (epididymo-orchitis)
- 8- varicocele
- 9- Torsion testis
- 10- Trauma to scrotum

Painful

11- Testicular tumour → (90% Painless, 10% Painful)

12- inguinal hernia → (if reducible painless, if ^{complicated} obstructed painful)



NB:- Varicocele & hernia are inguinoscrotal swelling while the others are pure scrotal swelling.

I. HYDROCELE

*** Definition:** - abnormal collection of serous fluid inside tunica vaginalis.

*** Types:** - ① Congenital: - due to persistence of processus vaginalis (infantile)

- occurs in 6% of full term babies.

- o/e it is reducible on lying down & you cannot get above it on palpation. (↑ by crying ↓ by sleep) ^{testis palpable}

- ttt: - surgical ligation of processus vaginalis.
 no surgery before 1 yr.

② Acquired: (A) Primary: - idiopathic (most common) = (vaginal hydrocele)

- due to imbalance of fluid secretion & absorption

- pure scrotal (can get above it), ^{irreducible} testis impalpable

(B) Secondary: - due to infection, tumour, trauma.

*** Investigations:** -

- Scrotal u/s to see if there is an underlying cause in testis or epididymis, also see type & amount of fluid. (No semen analysis as not ass. w/ infertility)

*** Clinical Picture:**

→ middle aged & elderly male.

• Symptoms: - only scrotal swelling in primary, or s/s of cause in 2nd type.

• Signs: - (+ve transillumination test in 99% ~ in old lesion or complicated may -ve) (+ve fluctuation test)

- testis impalpable in 1st hydrocele & can get above it.

- Examine abdomen & do PR if 2nd hydrocele

NB: In 1st hydrocele s/s develops slowly (chronic) → large size & tense.

- In 2nd " " " quickly (acute), usually not tense

1st (idiopathic) (vaginal) hydrocele is: pure, cystic scrotal swelling, translucent painless with impalpable testis.

*** Complications of vaginal hydrocele:** - (infrequent)

1- infection → pyocele (usually after aspiration).

2- hemorrhage → hematocele (either by trauma or spontaneous)

3- rupture by trauma, herniation through dartos.

4- huge size → buried penis interfere with micturition & intercourse.
 "no infertility"

* Treatment :-

- Congenital hydrocele → ttt after 1 yr (if not closed spontaneously)
- Acquired hydrocele → ttt underlying cause.
- primary (vaginal) (adult) hydrocele → treated by surgery^(hydrocelectomy) as follows:-
 - Jaboulay operation:- french (1860-1913) → open all layers.
tunica vaginalis edges are sewn (everted) together behind the spermatic cord.
 - Lords operation:- tunica is opened & plicated by series of stitches (each stitch from edge of cut to edge of the testis).
 - Excision of tunica:- rarely done if large calcified tunica.

NB:- Aspiration of fluid :- not done nowadays due to

it's complication as:-

① - recurrence (100%) (after week or so) → can be avoided by inj. sclerotherapy to fuse 2 layers of tunica.

② - Infection → can be avoided by a septic technique

③ - Bleeding (hematocele) & trauma testis → u/s guide ~~avoid~~

(NB) - sclerotherapy is contraindicated if patent processus vaginalis.

Complication undescended TESTIS •

(Trauma, Epididymo-orchitis, •

Sterility, Torsion, inguinal hernia, •

Seminoma) + psychological •

II-

VARICOCELE

* Definition:- elongation, dilatation & tortuosity of pampiniform plexus of veins (varicose veins of sp. cord).

* Site:- usually unilateral, Lt side (95%) because:-

- ① Lt testicular vein drains by right angle to Lt renal vein (the right testicular to IVC by acute angle)
- ② Lt vein longer, course than Rt
- ③ Lt vein compressed by sigmoid colon



NB:- Pampiniform plexus & testicular (Gonadal) vein are devoid of valves except at their ends

* Types :- ① Primary varicocele :- (Reflux varicocele)

- Unknown aetiology (but may be due to weakness of vein wall or valve damage or weak mesenchyme)
- affect young adult (15-30 yr), 17-24%

② Secondary varicocele :- (obstructive):-

- due to obstruction of testicular vein by tumour, ascitis, fibrosis, pelvic mass.

NB:- rapid developing varicocele in old pt with abd. mass highly suspicious of renal carcinoma.

* Complications :-

① Subfertility (2% are infertile) due to ① higher temp. in scrotum by venous congestion affecting spermatogenesis (also ② mechanical compression of veins and ③ hormonal Ad & NAD → hypochemia atrophy of testis)

② secondary hydrocele & thrombophlebitis.

* Investigations :-

- Doppler or duplex scan → reversal blood flow in 1st varicocele (not in 2nd)
- semen analysis → ↓ sperm count & vitality (specially if bilateral) (abn. forms, motility)
- abdominal u/s if 2nd varicocele suspected → renal c.c. (hypernephroma)
- scrotal u/s for atrophic testis.

semen 2-5 >5 infection, <2 obstruction or wrong collection

* Clinical Picture

- Usually a symptomatic, dragging sensation or aching pain specially on prolonged standing or hot weather. & painless
- may complain of infertility.
- O/E :- hanging of scrotum (lower level), feeling of "bag of worms" or ^{↑ by Valsalva's maneuver.} may be visible if large varicocele, cannot get above it. ± atrophic testis
- ↓ or disappear on lying down (but not ↓ in secondary type)
- in 2^{ry} s/s of underlying cause. (no fluctuation test)
(no transill. test)

* Grades :-

- Grade I :- not visible, palpable with Valsalva maneuver. [subclinical type].
- Grade II :- visible & palpable " " " [" "].
- Grade III :- —————→ palpable without " " [on standing only]
- Grade IV :- visible & palpable " " " [on standing & lying ↓ on lying down]

NB: 2^{ry} varicocele palpable on standing & lying @ same degree

* Treatment :-

- 1^{ry} varicocele → varicocelelectomy (laproscopic or open) or sclerotherapy
- ① — open varicocelelectomy either high or low ligation.
 - high ligation :- supra inguinal approach (above deep ring)
 - Ballomo 1948 - ligation of testicular vein (usually 2 veins retroperitoneal)
 - recurrence 25% (due to collaterals).
 - low ligation :- inguinal approach.
 - ligation of pampiniform plexus of veins.
 - recurrence 7%.
- ② — sclerotherapy :- inj. of sclerosing agent into veins.

NB :- surgery indicated if infertility (absolute) or large painful varicocele
- mild cases with no infertility specially GI & II → conservative as scrotal support, avoid constipation & long standing.

- ③ — laproscopic ligation of testicular vein is a modern ttt.
- ④ — Embolization of testicular vein is ttt of choice if recurrence.

- 2^{ry} varicocele → treat underlying cause.

III- EPIDIDYMAL CYSTS :- "retention cyst"

① SIMPLE EPIDIDYMAL CYST :-

- cyst filled with crystal-clear fluid, more in 40 yrs. & middle age.
- Common, usually multiple, often bilateral, vary in size.

② SPERMATOCELE :-

- cyst filled with cloudy fluid containing spermatozoa.
- unilocular nearly always in head of epididymis (above & behind testis)
- can reach large size (dpt thinks that he has 3 testes)

* C/P of epid. cysts :-

- generally painless scrotal swelling, usually small, smooth surface, with +ve transillumination test (may be -ve in spermatocele).
- testis is palpable (unlike vaginal hydrocele). Dx → US

* Treatment :-

- usually no treatment (except if large symptomatic as bilateral spermatocele may affect fertility very rare)

* NB :- spermatocele does not affect fertility except "postoperative complications so surgery done only if large & complicated."

IV- HEMATOCELE :-

* Definition :- accumulation of blood (or bd stained fluid) in tunica vaginalis

① ACUTE HEMATOCELE :-

- Caused by trauma, iatrogenic (biopsy, aspiration), torsion, infection (funicula epid. orchitis)
- Clinically → rapid onset, tense, tender, -ve transill.
- treated → by urgent evacuation & excision of tunica vag. & if there is tear in T. albuginea stitch it, give antibiotics, analges

② CHRONIC HEMATOCELE :-

- Caused by neglected acute Hematocele, malignancy, blood disease.
- Clinically → pain (slight), heaviness, late hard, -ve transill. (D/D tumour)
- treated → early by clot dissection, tunica excision
late → orchidectomy (to exclude malignancy)
- complicated by infection, atrophy (compression), calcification. (D/D malign.)

V - **TORSION TESTIS** :

- * Definition :- twisting of testis and epididymis around axis of sp. cord.
- It is a surgical emergency. , more in 10-25 yrs

* Aetiology (predisposing factors) :-

- 1 - imperfect descend of testis (und. or ectopic).
 - 2 - Long mesorchium.
 - 3 - Capacious tunica vaginalis surrounding whole testis (clapper in bell)
 - 4 - spiral arrangement of cremasteric muscle.
- the existing cause usually a minor trauma or straining, but may be spontaneous at sleep.

* Clinical Picture :-

- Sudden pain (^{agonising} severe) in scrotum, groin & lower abdomen ± vomiting.
- O/E :- scrotum, tender, oedematous, red, testis higher than normal. (shock + ↑ Pulse rate, sweating may present)
- D/D :- acute epididymo-orchitis → to differentiate elevate the scrotum
 - if pain ↓ epididymo-orchitis
 - if pain ↑ torsion "Prehn's sign".

in epid. orchitis → gradual onset, dysuria.

* Investigations :-

- Urgent Doppler (obstructed flow), urgent duplex scan (if available)
- Exploration if doppler & duplex not available & suspected Dx.

NB: hanging up testis → torsion, hanging down → varicocele or tumour.

* Treatment :- "send pt straight to surgery".

- Urgent exploration of scrotum, if testis viable do detorsion & (untwist) orchidopexy, if gangrene do orchiectomy.
- the opposite testis should be fixed at same time as predisposing factors are commonly bilateral.

VII: **EPIDIDYMO-ORCHITIS** :-

- Inflammation of testis alone (orchitis) is rare, It is usually assoc. with inflammation of epididymis (epididymo-orchitis) or with the spermatic cord & epididymis (funiculo-epididymo-orchitis).

* Types :-

- ① acute epid.-orchitis
 - **Specific** :- by bacteria causing STD e.g. ^{chlamydia} N. Gonorrhoea..
 - **Non-specific** :- bacteria (E-coli, strept... etc) or viral.
- ② Chronic epid. orchitis
 - **Non-specific** :- following acute epid. orchitis
 - **specific** :- e.g. TB, Φ (syphilis), Φ (Bilh.), filariasis

Acute epididymo-orchitis :-

* Route of infection :-

- ① Descending infection (common route) through vas deferens from urethritis, prostatitis, post operative, instrument.
- ② Blood born (rare) secondary to mumps.
- ③ chemical epididymitis by urine reflux to vas $\rightarrow$ epididymis.

* Clinical Picture :-

- Symptoms :- severe scrotal & groin pain, dysuria
- signs :- tenderness, hotness, redness, swelling $\pm$ 2nd hydrocele.

* Investigations :-

- CBC, ESR, c/s of urine & urethral discharge if present.

* Treatment :-

- Antibiotic [usually member of quinolones group] given 2-3 wks
- rest for first few days, drink plenty water.
- scrotal elevation (relieve pain unlike torsion $\uparrow$ pain), cold spongy, if pus mass & drainage, if doubtful Dx do exploration.

* D/D of epid. orchitis :-

- ① Orchitis :- in epididymorchitis pyrexia is higher, more redness & oedema.
- orchitis is viral e.g. following mumps parotitis in adolescent
- ② other causes of painful scrotal swelling as :- torsion, trauma, hematocoele, strangulated hernia.

PENIS DISORDERS

I- HYPOSPADIAS

Toronto notes 2012

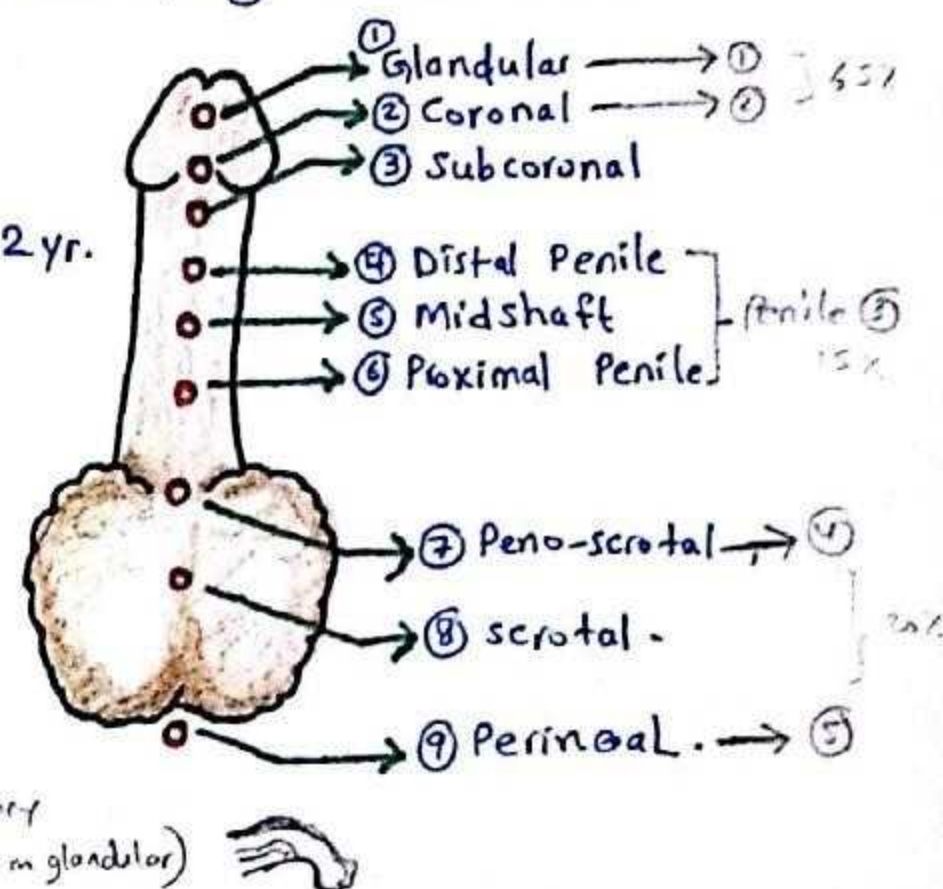
- * **Definition**:- opening of the ext. urethral meatus on ventral side of penis.
 - according to severity may $\rightarrow$ ^{infertility} difficult directing urine stream & infertility ^{+ve F/H in 8%}
- * **Incidence**:- very common $\frac{1}{300}$ live male births, white $\gg$ black.
 - may associated $\bar{e}$ undescended testis, ing. hernia, ventral penis curvature.
- * **classifications**:- see diagram

- 9 degrees. (or 5 degrees)

- * **Treatment**:- early surgical correction before 2yr.

- **NB**:- circumcision should be deferred (postponed) because foreskin may be utilized in the correction.

- do u/s to exclude other anomaly
- the missing distal part of urethra is replaced by fibrous band (chordae)
- chordae must be released during surgery
- chordae $\rightarrow$ ventrally curved penis (except in glandular)



Types

- 1- glandular
- 2- coronal
- 3- Penile
- 4- penoscrotal
- 5- scrotal
- 6- perineal

II- EPISPADIAS :-

- * **Definition**:- reverse of hypospadias (urethra opens on dorsum of penis).

- * **Incidence**:- rare $\frac{1}{120,000}$ males & $\frac{1}{450,000}$ female.

- In male:-
 - 1- glandular $\rightarrow$ not ass. $\bar{e}$ incontinence.
 - 2- penile $\rightarrow$ 75% all " "
 - 3- peno-pubic $\rightarrow$ 95% " " "
 - 4- complete type.

- Epispadias is a mild form of bladder exstrophy (congenital absence of portion of lower abd-wall & ant. bladder wall) ^{ectopic vesica.}

- In female:- females $\bar{e}$ epispadias have a bifid clitoris, separation of labia, & most of them are incontinent.

- * **Treatment**:- surgery to straighten penis & correct urethra & incontinence

III PHIMOSIS & PARAPHIMOSIS

* PHIMOSIS :-

- Foreskin (Prepuce) ^{inability to retract prepuce} cannot be retracted over glans penis.
- may be caused by ^{or ② cong.} ① balanitis (infection of glans) due to poor hygiene
- complications are ① ballooning during micturition
- ttt = circumcision. ② balanoposthitis (inflamm. of prepuce), Paraphimosis & ^{Penile} cancer

* PARAPHIMOSIS :-

- Inability to reduce foreskin (^{caught behind} ~~over~~ ↑ glans penis) → glans oedema.
 ^{ttt: analgesia, gentle manipulation, circum. if oedema subsides}
- treated by circumcision.
- complications are: infection, glans ischaemia, gangrene.

IV CIRCUMCISION :- Toronto

* **Definition**:- removal of foreskin (prepuce).

* **Incidence**:- 30% worldwide, varies according ^{muslims, Jewish} religion.

* **Indications**:- 1- religions **Social**

- 2- Phimosis, paraphimosis (recurrent), prior to radiotherapy of ^{cancer} penis
- 3- recurrent balanoposthitis, balanitis, UTI.

* **Contraindications**:- ①- hypospadias.

②- F/H of bleeding disorders (investigate prior to circum.)

③- unstable or sick infant.

* **Complications**:- bleeding, infections, glans injury, urethral injury and meatal stenosis.

V PRIAPISM :- Toronto.

erectile dysfunction < Priapism - impotence.

- prolonged unwanted erection lasting > 4 hrs.
- swelling of corpora cavernosa (no corpus spongiosum involved → flaccid glans)
- treated by urgent decompression via needle aspiration of blood if primary (unknown aetiology ≈ 50% of pt) or ttt underlying cause if secondary to sickle cell, trauma, medications (α blockers, anticoag... etc)

NB:- Peyronie's disease:-

- benign curvature of penis commonly dorsal → upward curvature of erect penis.
- Usually 2nd to fibrous thickening of tunica albuginea.

CONGENITAL ANOMALIES

ملخص
summary

- = Not uncommon; 1/200.
- = Kidney if formed from intermediate mesoderm.
it consists of ① Excretory part :- from metanephros (at 5th wk)
② collecting part :- from uteric bud to arise from mesonephric duct.
- = Genital duct in male arise from mesonephric duct (Wolfran) but in female from Paramesonephric (Mullerian duct).
- = Kidney change position from pelvic to abdomen, ~~and~~ also shape was lobulated, direction was forward hilum & change Bd supply from median sacral, iliac to aorta.

* CONGENITAL ANOMALIES :

- ① Agenesis (aplasia) :- more in female, uni or bilateral.
- ② Hypoplasia :- small normal kidney, risk of HTN (small ^{renal} artery)
- ③ pelvic (ectopic) kidney :- usually unilateral.
- ④ Malrotated kidney :- pelvi-calyceal system directed forward.
- ⑤ Horse-shoe kidney :- united lower pole & malrotated.
- ⑥ crossed renal ectopia :- uni- or bilateral, more in male ♂.
- ⑦ Polycystic kidney :- always bilateral, AR. full of cyst, no cortex.
- ⑧ Medullary spongy kidney :- uni- or bilateral or segment
- ⑨ Double kidney :- more in female (1.9% of autopsy)
- usually lower kidney more functioning (3 collecting system (upper one 2 system))
- ⑩ Double ureter :- ① incomplete type (Y-type).
② complete type upper ureter opens below & medial to lower ureter in UB. upper → VUR
lower → ureterocele
- ⑪ Ureterocele, VUR & PUJ obstruction :- see obstructive uropathy.

OBSTRUCTIVE UROPATHY

- Obstructive uropathy include any obstruction that occurs anywhere in urinary tract. with the following symptoms :-

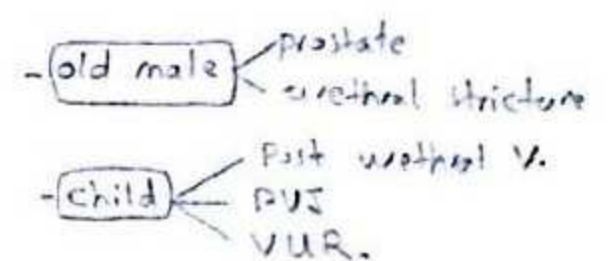
* Classification :-

- Acute or chronic obstruction.
- Congenital or acquired.
- unilateral or bilateral.
- partial or complete.
- extrinsic or intrinsic.

* Aetiology :-

* Congenital causes :-

- pelvi-ureteric junction (PUJ) obstruction
- aberrant renal artery.
- ectopic ureter.
- vesico-ureteric reflux (VUR).
- ureterocele & cystocele.
- neurogenic bladder injury (S₁, S₂, S₃) as in spina bifida.
- posterior urethral valve.
- Distal urethral stricture
- cong. external urethral meatal stenosis



* Acquired causes :-

① Primary (within urinary tract) :-

- Kidney stones (renal pelvis), tumour, cyst, hydronephrosis
- Ureteric stone, stricture, tumour.
- Bladder tumour
- prostate enlargement.
- Ext. urethral meatus stricture (after circumcision)
- Urethral stricture ~ (injury, catheter, infection as gonorrhoea)

② Secondary

- pregnancy (mechanical obst by foetal head, hormonal ↓ ^{ureteric} peristalsis)
- retroperitoneal fibrosis.
- pelvic tumours or metastatic LN.

HYDRONEPHROSIS

* Definition :-

- It is a septic distension of renal pelvis & calyces due to partial or complete obstruction.

* Aetiology :-

• see causes of obstructive uropathy. (Page 33, 35)

① Unilateral hydronephrosis: → ureteric stone, tumour, stricture, clot, ... etc

② Bilateral hydronephrosis: → retroperitoneal fibrosis, prostatic & urethral causes.

• according to age:

① in children → ^{post u. valve} PUJ obst, VUR (vesico-ureteric reflux), cong. stricture, neurogenic bladder (bladder dysenergia) --- etc

② in adult → prostate enlargement, stone, urethral stricture, tumours in trigon. → bil hyd. , --- etc.

* C/Picture :-

- 1- Pain ^(commonst) :- slight, dull aching or discomfort.
- 2- asymptomatic → discovered accidentally by US.
- 3- Swelling :- specially in children.
- 4- S/S of underlying cause, or S/S of complications. (CRF, ... etc)

* Complications :-

- 1- infection → pyonephrosis, stone formation.
- 2- complete cortical atrophy.
- 3- CRF (if bilateral).
- 4- rupture "rare" → usually traumatic.

* Investigations :-

- 1- Urine analysis (RBC, WBC, SG & crystals) ^{PH 5-7}
 10^3 + symptomatic pt → significant
 10^5 significant
 $N=1005$
- 2- US, CT, IVU (to assess if secreting kidney), isotope scan (to assess ^{kidney} functioning)
- 3- Ascending (retrograde) pyelogram. or descending (antegrade) pyelogram.

* Treatment :-

- treat underlying cause.
- nephrectomy if there's
 → non-functioning kidney by infusion urography.
 → US showed very thin parenchyma.
 → renal scan shows zero function.
 → other kidney normal.
- nephrostomy till treating obstruction. → then pyeloplasty if kidney functioning
 ↳ in advanced cases to ↓ size of pelvis.

POLYCYSTIC KIDNEY

cong. multicystic k.

* Aetiology:.

- Failure of fusion of collecting system (developed from mesonephric ureteric bud) with secretory system (metanephric cap).

* types:-

① Infantile type (AR):- "rare"

- very large kidney may obstruct labour.
- may die of pulmonary hypoplasia.
- renal failure, rickets are known complications.

② Adult type (AD):-

- incidence:- common than infantile type. (almost always bilateral)
 - about 50% ^{of pt} have cyst in liver (normally functioning liver), pancreas and 30-40% of pt have intracranial aneurysm.
- c/picture:- before 10 yrs no s/s (cysts do not form before age of 10y)
 - from 10-30 yrs → no s/s but US shows cysts.
 - after 30 yr → hematuria^{25%}, hypertension^{70%}, UTI, flank pain, uremia (renal failure by age of 50). → due to renin-ANG system
 - Pain due to Hge inside cyst, renal colic due to clot or stone
 - s/s of complications.
- Investigations:- Urine analysis (RBC, WBC, --etc), US → (diagnostic)
 - KUB, IVU (enlarged kidney & spider shaped calyces)
 - CT, ; blood u/e/c.
- treatment:- control hypertension, treat UTI.
 - low protein diet, drink excess fluid^{3L/day}.
 - if large cyst compresses pelvis → percut. u/s guided aspiration
 - Surgical (Rovsing's operation) to puncture superf. large cysts (to avoid compress. Hge, pain-) → not done bec. ^{u/s} aspiration better
 - If renal failure occurs → hemodialysis or renal transplantation.

PUJ OBSTRUCTION :-

- Pelvic-ureteric Junction obstruction (PUJO) is a common cause of hydronephrosis in children & adolescents.
- seen more in males with Lt side predominating. (10-15%) bilateral
- caused by failure of relaxation of PUJ.
- diagnosed by u/s in utero (if severe) but may be asymptomatic and detected incidentally during exam. (abd. mass, pain in flank, UTI)
- Dx by IVU → dilated pelvicalyceal system & abrupt contrast arrest at PUJ. with absent or normal caliber ureter.
- treated by pyeloplasty or endoscopic endopyelotomy if failed surgery and if kidney not functioning → nephrectomy.

URETROCELE :-

- cystic dilatation of terminal part of ureter (intramural part).
- presented & recurrent UTI, colic (due to stone inside it).
- IVU shows "Cobra head" sign or by cystoscopy → cyst.
- treated by excision & reimplantation of ureter specially if complicated by
 - stone formation.
 - hydronephrosis.
 - recurrent UTI.

Vesico-ureteric reflux :-

- Incidence:- 5 times more in female.
- aetiology:- due to defective valve at entry of ure
- c/Picture:- recurrent UTI, hydronephrosis.
- investigations:- MCU "micturating cysto uethrography"
- cystoscopy:- → ureteric openings are laterally placed, wide base of trigone, short submucosal ureter.

commonest cause of UTI in children (1/3 case)

Posterior urethral valve :-

- the most common cause of obstructive uropathy in infant & new born.
- occurs only in male.
- Pathology:- cong. membrane-like structure in distal prostatic urethra.
- C/picture:- in severe forms → palpable kidney (hydronephrosis), renal failure
 - in less severe forms → recurrent UTI, voiding dysfunction.
- investigations:- Voiding (micturating) cysto-urethrography (MCU) → [dilated posterior urethra & bladder ± reflux]
- treatment:- transurethral destruction of the valve.

Bladder diverticula :-

- Definition:- flask-shaped pouch of bladder wall (95% of pt are male).
- Aetiology:- ① congenital:- (rare) → true (all layers of bladder wall), solitary, above ureteric orifice. (empties urine & emptying bladder no residual urine)
 - ② Acquired:- (common) → false (no muscle layer) often multiple, always ass. & distal obst. & trabeculation (↑ pressure)
 - not emptying & bladder (residual urine inside).
- C/picture:- usually a symptomatic: s/s of underlying disease.
 - double micturation (filled & urine at micturation then empty to bladder → immediate desire to micturate again).
- investigation:- IVU, ascending cystography, cystoscope.
- treatment:- treat underlying cause.
 - Diverticula are not excised unless complicated.
- Complications:- rarely may obstruct ureter if large, hydronephrosis.
 - stone, infection, sq. metaplasia → sq. c.c.

HAEMATURIA

summary

*** Definition :-** presence of RBCs in urine

*** Types :-** • According to No. of RBC :-

1- Microscopic H. → 1-5 RBC/HPF in male (8-10 in f).

2- Macroscopic H. → by naked eye.

• According to timing of H. :-

1- initial H. → due to urethral & prostatic lesions.

2- total H. → upper tract (kidney, ureter ^{lesion} & bladder ca)

3- terminal H. → lesion in neck or trigone of bladder.

• According to pain if present :-

1- Painful H. → e.g infection, stone, #. ... etc

2- Painless H. (silent) → malignancy (ca bladder)

D/D of coloured urine :-

1- concentrated urine → dark urine

2- obstructive jaundice → dark, Tea-like, frothy urine

3- Drugs → • pyridium, furantoin & Dindevan → deep red orange
• Rifampicin → deep yellow

4- hemoglobinuria, myoglobinuria, acute porphyria

NB :- bleeding through urethra & no urine called bleeding per urethra

*** causes :-**

(A) Medical causes :- glomerulonephritis, HPN, vasculitis, interstitial disease of kidney, renal artery thrombosis or embolism
- drugs → anticoagulant, cyclophosphamide.
- coagulopathy as hemophilia & thrombocytopenia.
- polycystic kidney & sickle cell disease.

(B) Surgical causes :- infection, tumour, trauma, stone, BPH.
- diverticulitis (bladder), bilharziasis, cervical tumour.

NB :- presence of clot in urine indicate :-

1- severity of pathology.

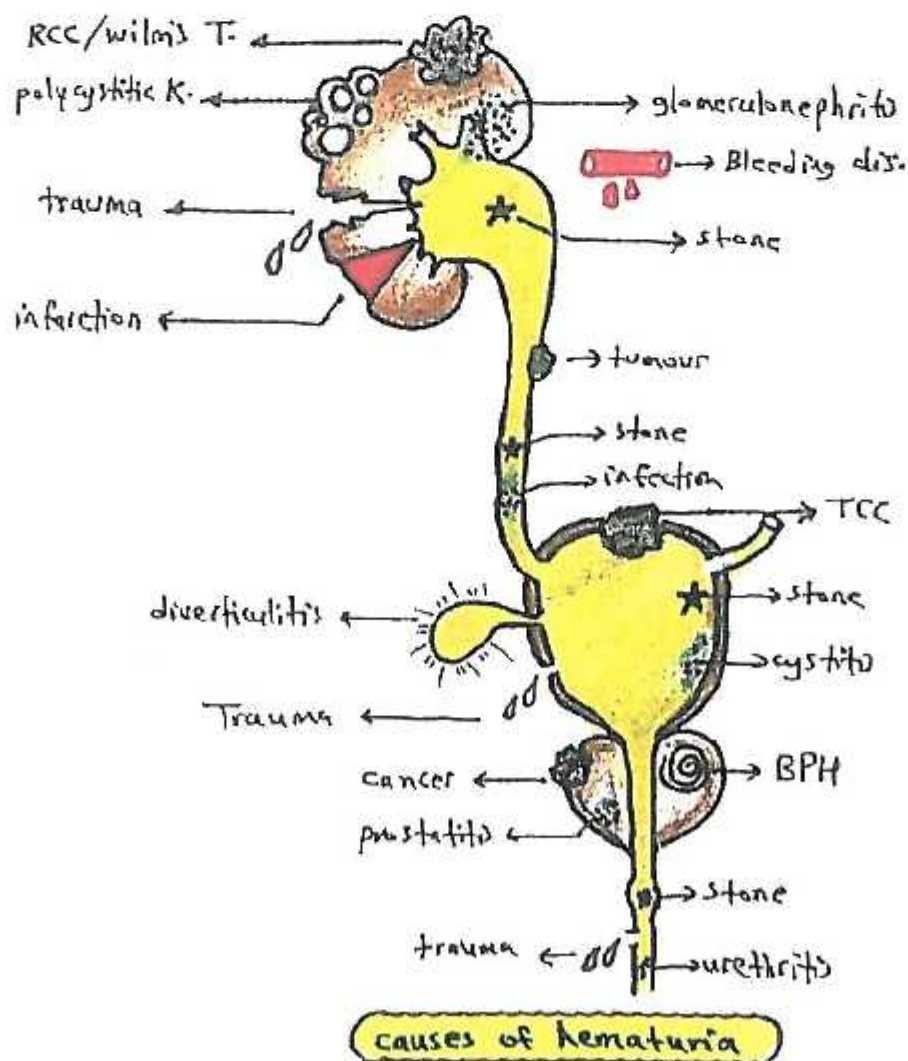
2- site of bleeding e.g if threadlike from upper U.T.

* Diagnosis :-

- good history $\rightarrow$ pain, dysuria, stream of urine, F/H, past medical --- etc
- good examination $\rightarrow$ e.g suprapubic tenderness --- etc
- investigations: $\rightarrow$ 1- Urine analysis (>10 RBC /HPF significant), WBC, C/S.
- 2- CBC, U/E/C.
- 3- U/S, IVU, CTU, MRU. KUB
- 4- cystoscopy, biopsy.
- 5- retrograde pyelography, ascending cystography.
- 6- CT scan

* Treatment:-

- if sever bladder hge $\rightarrow$ ABC if needed.
- irrigation via catheter $\bar{e}$ normal saline (remove clots)
- cystoscopy in quite active bleeding.
- Treat the underlying cause



MALE INFERTILITY

Toronto 2012

* Definition:-

- failure to conceive after one year of unprotected, properly timed intercourse. [either primary "never conceived" or 2nd "conceive before"]

* Incidence:-

- 15% of all couples (1/3 male, 1/3 female, 1/3 combined problem).

* Aetiology:-

{commonest cause is varicocele}

- Idiopathic: 25% of infertile males.
- pretesticular (endocrinal):- e.g. Kallman's syndrome (cong. hypoth. hypogonadism)
excess androgens, excess estrogen.
- testicular:- Varicocele (30-40% of infertile male) ^{70% (lecture)}
 - tumour, Post infection (mumps, STDs), torsion
 - cryptorchidism (<5%)
 - congenital → Klinefelter triad
 $\leftarrow$ small, firm testis.
 $\leftarrow$ gynaecomastia.
 $\leftarrow$ azoospermia.
- Post-testicular (obstructive): vas obstruction
 - cong. Kartagener's syndrome (AR) (→ defective cilia.)
- others → retrograde ejaculation, drugs, ERF, ch. liver disease
 medications (chemoth. ^{anabolic} steroid) → marijuana, cocaine, alcohol

* Physiology:-

- Testosterone is secreted ^{90%} from Leydig cells of testis under influence of LH from ant. pituitary
- about 10% secreted from Zona reticularis of suprarenal gland.
(in female 100% of her testosterone from suprarenal gland).
- Testis considered endocrinal (secrete test. hormone) and exocrine at same time (secrete sperm "not semen").
- spermatogenesis takes about 72 days.

URO- INVESTIGATIONS

* SEMEN ANALYSIS :-

Toronto 2014

WHO Guidelines normal semen analysis :-

- Volume : 2-5 ml
- Liquefaction : 20 min.
- Number of sperms :- > 20 million/ml (20-100) > 15 (Toronto 2014)
- Morphology $\rightarrow$:- 30% normal forms ($< 10\%$ abnormal Toronto 2011)
- Motility $\rightarrow$:- $> 40\%$ adequate forward progression ($> 50\%$ T. 2011)
- WBC $\rightarrow$:- $< 10\%$ HPF (or $< 10^6$ /ml semen).
- PH $\rightarrow$:- 7.2 - 7.8

* URINE EXAMINATION :-

1 • Physical $\rightarrow$ • Colour : colourless

• appearance : clear

• specific gravity :- (1.010 - 1.018) $\begin{cases} \downarrow \text{ in GFR.} \\ \uparrow \text{ in concentrated urine.} \end{cases}$

2 • Chemistry $\rightarrow$ • PH : 5.5 - 6.5 (acidic)

(if alkaline indicate infection $\bar{e}$ proteus, kleibrella)

• No protein, glucose, ketones, haemoglobin, or myoglobin

3 • Microscopic $\rightarrow$ • WBC < 3 (pus cells $\rightarrow$ pyuria), RBC

• Cast indicate degeneration of proximal convoluted Tub.

(hyaline cast present in cortex, red cast in tubules).

• if there's ovum, parasite, candida, yeast or crystals (urea $\rightarrow$ cat oxalate, cystine, phosphate)

4 • Bacteriology $\rightarrow$ • Culture in Makonky media - No. of colonies 10^5 $\leftarrow$ coli

5 • Hormones $\rightarrow$ • α F-protein, B.HCG

• VMA, metabolite of catecholamine in pheochromocytoma

URO. INSTRUMENTS

Summary

1. URETHRAL CATHETER :- (Foelly cath.)

- * Indications :-**
- 1- urine retention (commonest)
 - 2- pre- & post op., coma, ICU, neurogenic UB. input/output
 - 3- installation of chemotherapy & antiseptics.

- * Types :-**
- ① Non-self retaining (non balloon)
 - ② Self retaining (Ballon)
 - 2 way Latex
Silicon
 - 3 way Latex
Silicon
 - hematuria catheter

2 way → one way for ^{urine} drainage & other to inflate & deflate ballon (by normal saline)

3-way → as 2 way + way for irrigation & installation of treatment

hematuria catheter → it is 3 way & silicon rubber, (not latex "natural rubber") reinforced with nylon coil to resist collapse under suction

NB :- - caliber of catheter written in French normally 20 (14-22) (1 French = $\frac{1}{3}$ mm)

NB :- capacity of ballon (NS) written in ml (cc).

e.g Self retaining 2 way urethral catheter

- * Complications :-**
- 1- during insertion → trauma & bleeding, infection
 - 2- while in urethra → infection, stone (egg-shaped) ^{calcification} ^{ballon}
 - 3- when removed → trauma to urethra or UB
 - 4- after removal → stricture of urethra.

- * Contra indications :-**
- 1- bleeding per urethra → do suprapubic
 - 2- urethral trauma.

*** insertion :-** complete aseptic technique, I-cy gel, xylocain, insert slowly until urine escape → inflate ballon.

2. SUPRAPUBIC CATHETER :-

- * Indications :-
1. failed urethral catheter.
 2. when urethral cath. contraindicated.
 3. long term catheterization.

- * insertion :-
1. percutaneous
 2. open surgery.
- done under complete aseptic tech. midline, two fingers suprapubic, UB must be full

3. URETERIC CATHETER :-

- 16 cm, radiopaque.
- Indicated as diagnostic at cystoscope (retrograde urography)

4. DOUBLE J. CATHETER :-

- 35 cm long, radiopaque. called "ureteric stent".

- * Indications :-
1. to pass obstruction.
 2. prophylaxis with **ESWL**.
 3. ureteric injury or tumour.

- * complications :-
- displacement, ↑ frequency, urgency.
 - infection, hematuria, retention.

5. NEPHROSTOMY TUBE :-

- * indications :-
1. diagnostic (antegrade urography), ^{renal pelvis} measure ↑ pressure
 2. therapeutic (commonest) in pyonephrosis & obst.

6. URINE CONDOM :-

- external use in male who - unable to walk
- has urine retention

7. URINE BAG :-

- collect urine & obtain output of urine

URO-TUMOURS

A - TESTICULAR TUMOURS :-

- I - Primary :-**
- Germ cell tumours (GCT) :- (95%), all are malignant.**
 - Seminoma (35%).
 - Non-seminoma :- embryonal cell ca (20%), Teratoma (5%), mixed cell type (40%), chorioc. (<1%), yolk sac (<<1%).
 - Non - GCT :- (5%), usually benign :-**
 - Lydig (testosterone, precocious puberty).
 - Sertoli (gynomastia, decreased libido).
- II - Secondary :-** usually lymphoma or metastases (e.g lung, prostate, GI).

B - KIDNEY TUMOURS :-

- I - Benign :-**
- cystic kidney diseases :-**
 - simple cyst (commonest), PCK (polycystic kidney disease), Medullary sponge kidney^{MSK}, Von Hippel-Lindau syndrome^{VHL}.
 - Benign renal mass :-**
 - adenoma (commonest benign), angiomyolipoma (renal hamartoma), oncocytoma, others (fibroma, lipoma, angioma...etc).
- II - Malignant :-**
- Primary :-** Wilms' tumour, RCC, others (sarcoma...etc)
 - Secondary :-** from surrounding or distant.

C - PROSTATE TUMOURS :-

- I - Benign :-** BPH " Benign prostate hyperplasia.
- II - Malignant :-** Primary (~~adenocarcinoma~~) or secondary.

D - U. BLADDER TUMOURS :-

- Urothelial tumours arise in collecting system (from pelvis to urethra) and they are usually multicentric with high recurrence.

I. Benign :- epithelial (villous papilloma "premlig", adenoma) or C-T (angioma)

II. Malignant :- primary (carcinoma) or secondary.

E - PENILE TUMOURS :-

I. Benign :- - cyst, hemangioma, nevus, papilloma.

- premalignant as leukoplakia, condyloma, balanitis ^{xerotica} obliterans

II. Malignant :- SCC (>95%), BCC, melanoma, Paget disease of penis (v. rare)

- NB :- penile tumours are rare (<1% of cancer in USA), in 60 years.

- NB :- Risk factors for malignant are :- STD, phimosis, uncircumcised penis, ch. inflammatory disease.

Dx needs biopsy, spread by lymph > blood.

ttx: wide excision $\pm$ lymphadenectomy, cryotherapy, laser.

- TNM class. of cancer penis T_1 = invade Buck's fascia $\begin{cases} T_{1a} \text{ no LN or vessel} \\ T_{1b} \text{ lymph or vessel} \end{cases}$

T_2 = invade corpus spongiosum or cavernosum

T_3 = " urethra or prostate.

T_4 = " other adjacent structure.

- Prognosis :- overall 5yr survival rate is about 50%.

• simple renal cyst :- usually solitary, v. common (50% of above 50 yr)
assessment by Bosniak classif.

TESTICULAR TUMOURS :-

* INCIDENCE :-

- rare, but most common solid malignancy in young males 15-34 yr. Toronto
- represents 1-2% of male malignancy, 1-2% bilateral, (more in Right undescended testis)
- mostly malignant (99%), high social class.

Seminoma > 30
Teratoma 20

* AETIOLOGY :-

- cryptorchidism (undescended testis), atrophy, sex hormones, HIV, infertility, family history (10% of pt has H/O undescended testis). ↑ risk 10-40%

* PATHOLOGY :-

1. Germ cell tumour :- (95%) (all malign.)
 - seminoma (35%) ^{50%}
 - Non-seminoma
 - embryonal 20%
 - Teratoma 5% ^{30%}
 - chorioc. <1%
 - Yolk sac <<1%
 - mixed cell 40%
2. Non-GCT :- (5%) (usually benign)
 - Lydig (testosterone precocious puberty)
 - Sertoli (gynecomastia, ↓ libido)

- spread :-
 - Direct :- to epididymis, tunica, sp. cord ... etc
 - Lymph :- to Para-aortic LN, iliac, mediastinal LN.
 - Blood :- to lungs (mainly) or liver, bone, brain, kidney.

- staging :-
 - T₁ = limited to testis ^{& epididymis} without lymphatic/vascular invasion
 - T₂ = " " epid. & testis with " " "
 - T₃ = invade spermatic cord ± " " "
 - T₄ = invasion of scrotum ± " " "
 - N₁: < 2 cm, N₂: LN 2-5 cm, N₃: > 5 cm. (as RCC)
 - M₀: no mets, M₁: distant metastasis.

- other staging :-
 - stage I :- limited to testis, epid. or sp. cord.
 - stage II :- " " retroperitoneal LN.
 - stage III :- metastasis to supradiaphragmatic LN ^{Virchow's}
 - stage IV :- distant mets. (lung)

* C/PICTURE :-

- Painless testicular swelling ± discomfort, heaviness
- Pain 10% (H/O or infection), hydrocele 10%, gynecomastia,
- s/s of metastasis (rare) → abd. mass (LN), Virchow's LN, lung, back pain (paraortic LN)

* INVESTIGATIONS :-

- Scrotal US (hypoechoic), tumour markers (B-hCG, LDH, AFP).
- Dx established by radical inguinal orchiectomy (need aspiration is contraindicated, no scrotal biopsy just inguinal).

Trans-scrotal biopsy or orchiectomy is avoided bec. of different lymphatic drainage of testis (Para-aortic) & scrotum (superf. inguinal LN).

Tumour markers are :-

- ① α fetoprotein (AFP) :- produced by yolk sac tumour. never elevated with seminoma.
- ② B-hCG :- positive in 7% of pure seminoma.
AFP & hCG +ve in 85% of non-seminoma
- ③ PAP (placental alkaline phosphatase) $\rightarrow$ placental tumour
- ④ LDH :- in advanced tumour size.

* TREATMENT :-

- Orchiectomy through inguinal approach for all stages. π
(consider sperm banking, testicular prosthesis) ^{before ectomy frozen-section biopsy can done.}
- adjuvant therapies. (Teratoma) $\rightarrow$ chemoth. (seminoma) $\rightarrow$ radiotherapy to para-aortic LN

* PROGNOSIS :-

- 99% cured with stage I & II
- 70-80% complete remission with advanced disease.

SEMINOMA	TERATOMA
origin from seminiferous tubule (30-45 yr), usually unilateral slow, low malignancy, radiosensitive spread by lymph (Para-aortic), better prognosis Pure seminoma no $\uparrow$ in AFP, 7% has HCG	from embryogenic totipotent cells (20-35 yr) rapid, higher malignancy, radioresistant spread by blood (lung), bad prognosis AFP & hCG +ve in 85% of cases.

NOTES :- LDH represent nature of tumour (large or not), (mets or not), (aggressive or not)

- Excisional biopsy of testis done after clamp during surgery
if bilateral do frozen section from each testis.
- if prognostic (B-HCG, LDH) are very high $\rightarrow$ adjuvant π
stage I, II $\rightarrow$ radio + chemo (Ethinambiol only)
III, IV $\rightarrow$ " " (cisplatin, Etoposide, Ethinambiol).
Teratoma only chemotherapy.

BPH: BENIGN PROSTATE HYPERPLASIA

Senile prostate hyperplasia

BPH = periurethral hyperplasia of stroma & epithelium in prostatic transitional zone - T.

* INCIDENCE :-

- about 50% of male > 50 yrs has BPH (senile enlargement of prostate) SEP
- BPH is not premalignant, has low mortality & morbidity.

* AETIOLOGY :- unknown

- Hormonal imbalance → imbalance bet. androgens & estrogens (aging).
- Neoplastic theory (less accepted) → BPH is benign T. (fibromy adenoma).
 - DHT required
 - genetic: ↑ in 1st degree R. & twins
 - impaired apoptosis, estrogens & other GF.

* PATHOLOGY :-

- Macroscopic :- BPH more in median and/or lateral lobes, false capsule
- micro :- hyperplasia of glands, fibrous & ms. → stromal nodule. mainly in transitional zone (periurethral).

* Pathophysiology (Effect) :-

- urethra :- elongated, narrow, ↑ posterior curve.
- Bladder :- detrusor ms hypertrophy → trabeculation → herniation with diverticulae → ms atony → residual urine.
 - middle lobe project into UB → post. pouch → residual urine & stone + UTI.
 - compression of prostatic venous plexus → vesical piles → hematuria
- ureter & kidney :- hydroureter, hydronephrosis → UTI → pyelonephrosis
- sexual organs :- early ↑↑ lipida, later may → impotence.



* CLINICAL PICTURE :-

• Uncomplicated cases :-

- 1- Urgency (1st symptom → first nocturia) urgency = sudden compelling urge to urinate.
- 2- Frequency (2nd symptom) (FUN = Frequency, Urgency, Nocturia)
- 3- Hesitancy (difficult start due to congestion by straining).
- 4- weak interrupted stream.
- 5- Post-micturition dripping "detrusor failure"
- 6- urge incontinence, overflow incontinence, dysuria.

• Complicated cases :-

- 1- acute (painful) & ch. (painless) retention retention (ischuria) = lack of ability to urinate
- 2- hematuria, cystitis, stone, CRF, impotence ... etc
(NB acute retention may be the 1st symptom)

NB :- frequency caused by → incomplete emptying, bladder instability (detrusor hypertrophy) and complications as cystitis, diverticulitis

American U. Society

AUA score

Freq.
Urgency
Nocturia
Weak stream
Intermittency
Straining
Emptying incomplete
Feeling
each s/s grade 5
0-7 mild
8-19 mod.
20-35 severe

- dysuria is not a part of score. ①

* INVESTIGATIONS :-

- Urine analysis U/A, serum PSA (N. 0-4 ng/ml)
- Flowmetry (max. flow rate < 15 ml/sec indicate obstruction)
- Urodynamic study is the best method but expensive & unavailable.
- Radiological:
 - US → residual urine (> 100 significant), enlarged prostate and assess kidney, bladder, hydronephrosis
 - TRUS (trans rectal US) → assess size & see if homogenous or heterog., to take biopsy (8-12) if ↑ PSA.
 - IVU → kidney function, hydronephrosis, ureter --- etc

Biopsy taken by TURP, TRUS, or transperitoneal if abnormality in urethra and rectum.

complications of BPH → retention, infection, hydronephrosis, hematuria, stone, renal insuff.

* TREATMENT :-

(A) Retention ttt :- by ^{Foley} catheter, if difficult do suprapubic catheter
 - decompress UB slowly (to avoid hematuria & hypotension).

(B) Medical ttt :- for mild cases, unfit pt, who doesn't complete his family

① α_1 -blockers : e.g Prazosin, omnic (selective α_{1A} blocker) ^{3mg twice for life}

- block α_1 adrenergic receptor → smooth ms relax → ↓ urethral compression (does not ↓ size but ↑ flow)

- 1st line (less S/E), omnic is orthostatic hypotension

② 5- α reductase inhibitor :- (Proscar = finasteride) ^{once daily for 6m. then another course after 2m}

- It inhibit conversion of testosterone to DHT (dihydroxy testosterone)

so ↓ size by 30%, improve S/S

- Proscar S/E → ↓ lipids, ↓ ejaculatory volume, impotence.

NB :- if BPH epithelial element give proscar
 if " stromal " " omnic

(C) Surgical ttt :- indicated in
 acute & ch. retention.
 severe UTI & obstructive S/S.
 bladder stone, diverticulae.

BPH surgery indication

① absolute :-

- RF
- retention

② relative :-

- recurrent UTI
- renal insufficiency
- UA stones

① closed surgery (endoscopic)

② TURP (transurethral resection of prostate) "Gold standard"

③ TULP (" " Laser ablation of prostate).

④ Transurethral heat vaporization, balloon, stent - not done

NB:- TURP :- done by using cysto-resectoscope, send to histopathology, limited use if very large adenoma (making the procedure long & hazardous).

NB:- TULP :- has less bleeding, but no biopsy, high cost, long time catheter, prolonged irritative s/s.

② open surgery (prostatectomy)

- used if large gland ($>80g$), if ass. $\in$ bladder stone, diverticulae (Normal wt of gland $\approx 15g$).

a)- Transvesical prostatectomy $\rightarrow$ done if ass. $\in$ bladder pathology.

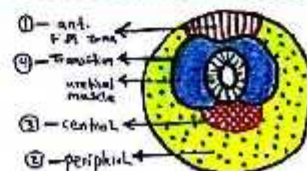
b)- Retropubic (Millin's) prostatectomy $\rightarrow$ via retropubic space (Cave of Retzius).

* Complications of prostatectomy :-

- ① bleeding (main problem), clot retention may occur.
- ② retrograde ejaculation ($>90\%$ of cases) due to int. sphincter damage
- ③ Infection (UTI), bladder neck stricture, urethral stricture.
- ④ impotence (2-5%) due to pudendal N. injury.
- ⑤ incontinence (1 in 1000) by sphincter damage.
- ⑥ TURP syndrome :- occurs in TURP due to over absorption of irrigating hypotonic fluid used during endoscopy, characterized by hypervolemia, dilutional hyponatremia & intravascular hemolysis
- Use glycine (isotonic) for irrigation to avoid TURP syndrome (but if procedure lasts >2 hr also glycin absorbed).
- ⑦ CV and respiratory problems, death in 0.2-0.5%

NB:- the prostate is not divided into lobes but is actually into zones :-

- ① Anterior fibromuscular zone
- ② Peripheral zone $\rightarrow$ (cancer arise here)
- ③ Central zone
- ④ Transition zone (periuethral) $\rightarrow$ (BPH arise here)



BPH central & cancer peripheral.

	Urinary Bladder Carcinoma	Prostate cancer. "Man-killer"
Incidence	- 50-70 years - M > F (3:1) - second most common cancer in UT	- > 60 yrs. risk of developing histologic ca. is 70% in 80 yrs - First common malignancy in male - second commonest cause of death from cancer. (3rd commonest death → Toronto).
Aetiology	1. Smoking (strongest) → 4 times ↑ risk. 2. aromatic amines, naphthylamines, benzidine, tryptophan • 20% occupational → Dye worker, painter & Tyre worker 3. Schistosoma, Bilharzia, haemato hematuria. 4. ch. irritation by cystitis, stones, catheterization 5. Villous papilloma, diverticulae (NB 3, 4 causes sq. c.c.).	1. age (strongest). 2. race: higher in North America, Europe (lower in China, Japanese due to vit-A → protective in Asian food) 3. Diet: ↑ fat diet & red meat. 4. genetic: 1 in 9% (↑ risk 2-3 times in 1st degree R). 5. environmental exposure to cadmium, radiation, & U/V. ca. prostate not occurring in castrated people
Pathology	Macro:- mainly at base (trigone) in TCC (but in sq.c.c. common in inferolateral wall) - fungating, ulcerative, lump-papillary. Micro:- 90% TCC "transitional cell ca" 8% sq.c.c, 2% others (adenoc) Spread:- Direct: to adjacent. - lymph: int. & ext. iliac LN then para-aortic LN. - Blood: (v. late) to lung, LBB - implantation in scar staging & grading Grade I:- well diff (60% invasive) II:- moderate diff. (50% invasive) III:- poorly diff. (80% invasive) Grading is the single most imp. prognostic factor for progression 1. Non-M3 invasive: (superf.) 75% (5y survival > 80%) 2. invasive ca.: 25% (5y. → 50%) 3. ca. in situ. TNM staging: Ta = non-invasive papillary ca. T1 = involves basement memb. (submucosa) T2 = half musculosa T3 = whole musculosa T4 = outside T1a → Pericystic fat T1b → adjacent organ. N1 → LN < 2cm N2 → 2-5cm N3 → > 5cm M0 → No mets M1 → metastasis	- mainly in peripheral zone, more in posterior lobe. - hard irregular nodule in area of H&N - 95% adenocarcinoma. - 5% others [TCC (8%), neuroendocrine (5%)] - Direct: to adjacent structures - lymph: hypogastric LN → iliac LN → para-aortic LN - Blood: 90% to bone (lumbar vertebra) "osteoblastic" - Grade I: well differentiated - II: moderate diff - III: poorly diff - IV: undifferentiated - Gleason grading:- - G1 = 2-4 - G2 = 5-7 - G3 = 8-10 Occ. to gland. diff. growth pattern - PIT = prostatic intraepith. neoplasia sign of cancer without basement memb. destruction. TNM staging: T1 = impalpable T1a = < 5% of tissue of TURP T1b = > 5% " " " T1c = Dx by need biopsy (TPSA) T2 = palpable (regular) T3 = locally extensive (seminal vesicle, capsule) T4 = fixed to organ or rectum. N1 → < 2cm N2 → 2-5 N3 → > 5cm M0 = no mets. M1 = metastasis

	U.B ca.	Prostate ca.
- Clinical picture :-	- 90% → hematuria (painless, total, gross) - 50% → Pain - 17% → clot retention - asymptomatic in 20% → incidental - hydronephrosis, uremia - can mimic (LUTS) → urgency, freq., dysuria, weak stream. - palpable mass on bimanual exam. (ms invasion)	- usually asymptomatic discovered on TURP, DRE, ↑ PSA. - S/S of urine obstruction → retention, incontinence, hematuria, hemospemia - S/S of mets: low back pain, LL oedema (due to iliac vein invasion). - renal failure, wt loss, paraplegia. - tenesmus: due to rectal invasion.
investigation	①- cystoscope → invstg. of choice, biopsy ②- US, CT, or IVU. ③- U/A, urine C/S, urine cytology. ④- Tumour marker (NMP-22, BTA, immunogt. FDP)	①- TRUS (transrectal US) → best with TRUS guided biopsy ②- U/s, ^{CT} CBC, U/E/C, bone scan ③- Tumour marker: - PSA = prostate specific Ag. - PAP = prostatic acid phosphatase - PCA3 = (in urine) → very expensive, not popular - ALP = ↑ in bone mets.
Treatment	• Tis, T1: ① TURBT (Trans-urethral resection of prostate) ②- cystoscopy & follow up. ③- Local installation of chemotherapy intravesical as BCG (+ recurrence & progression) • Ta: ①- TURBT. ②- cystoscopy program - every 3 m. for 2 yr. - every 6 m → 2y - every 12 m → 2y • T2: ① TURBT. ②- cystoscopy program. ③- radical resection → Gold standard. • T3: ① surgery if no mets. by - partial cystectomy or - radical cystectomy with urinary diversion. - ileal conduit - Indiana pouch - ileal neobladder ②- radiotherapy if no mets. ③- chemotherapy " " " • T4: palliative radioth., chemoth. (cisplatin). 15 yr survival for T1=90%, T2=55%, T3=20%, T4=<5%	• T1, T2 cancer: - radical prostatectomy (Prostate, SV) No LN (complications → incontinence, impotence) - radiotherapy (brachy radio.) → radioactive seeds implantation. (complication → rectal ulceration) - high intensity focused US (HIFU) for unfit pt. - Watchful waiting (no ttt) → old & unfit. • T3, T4 cancer - for T3 → hormonal ttt ↓ testosterone - LRH agonist Zoladex. - bilateral orchiectomy - for T4 → radioth. + hormonal. • Metastatic ca. - Chemotherapy (docetaxil + prednisolone "Taxotene", metoxantone) - give Zoledronic acid "Zometa" preserve Ca⁺⁺ inside bone if early bone mets. to prevent path. 10 yr survival → T1, T2 as normal life, T3, T4 = 40-50% 15 yr 4% 5 yr.



Causes of high PSA :- "N = 0-4 ng/ml" [4-10 = gray zone]

- ① prostate cancer (> to usually)
- ② BPH
- ③ cystoscopy
- ④ DRE or prostatic massage
- ⑤ Prostatitis
- ⑥ catheter

Types of PSA analysis :-

in pt 70-80 yr → PSA 5-6 ng/ml is normal

(PSA is an enzyme produced by prostate epith. cells to liquify ejaculate)

- ① PSA density (↑ according to prostate size) = $\frac{\text{Prostate mass}}{\text{PSA}}$
- ② PSA velocity. velocity of elevation
- ③ PSA ratio = $\frac{\text{Free}}{\text{Total}}$ (if $\leq 20\%$ ^{may} malignant, if $> 20\%$ → benign)

- some pt $\hat{=}$ ↑ PSA (4-10) give ^{pluggie, cipaf.} antibiotic course then repeat PSA to exclude prostatitis
- if normal PSA & pt $\hat{=}$ nodule on US → do biopsy

* NOTES :- during DRE (PR) :-

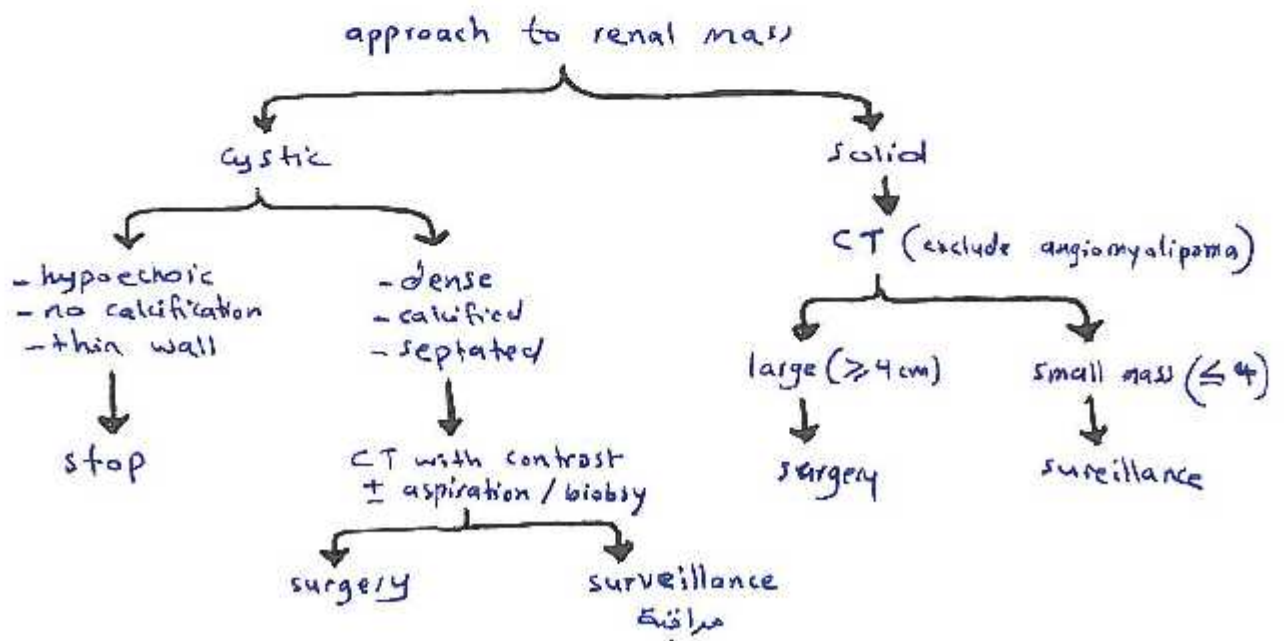
- ① BPH → smooth, firm, symmetrical enlargement, sulci clear.
- rectal mucosa slides (long duration on history).
- ② cancer → irregular, hard, asymmetrical, sulci obliterated.
- rectal mucosa fixed (short duration).
- ③ prostatitis → smooth, soft, very tender (not done) (C/I).

- * castration (removal of testis) done for ^{castration} religious or racial reason → south & east asia ^{africa}
 - prostate cancer
 - & sex drives, obsessions or behaviour
 - male to female transsexuals, birth control
- * Penectomy (penis removal) done for
 - ① cancer penis
 - ② Fournier's gangrene
 - ③ male to female transsexuals
- * nephrectomy done → for tumour, trauma, TB, non functioning kidney.

	WILM'S Tumour	RCC 'Renal cell carcinoma'
Incidence	2-5 years M=F 10% of childhood malignancy 10% are bilateral 90% of UT malign. 90% < 7 years 90% has hematuria 90% long-life survival	50-60 yrs M>F (3:1). 3% of adult malign. (8th most common) 1% bilateral. 3 other names: hypernephroma, adenocarc., Grawitz tumor. 4% synchronous, 4% multiple at same kidney.
Aetiology	- hereditary in 30% of pt. - association in "WAGR" syndrome (Wilm's, Aniridia, GU malformation, MR) associated with ch. 11 abnormalities. - ass. with Beckwith-Wiedemann syndrome or Denys-Drash synd.	- Top 3 risk factors are:- (smoking, obesity, & HTN). - Von-Hippel Lindau (VHL) disease (AD, ch. 3 mutations), hepatopathy (tuffer synd.), hereditary papillary cell ca. - adenoma 10%, PCK, horseshoe kidney, staghorn, renal dialysis, age.
Pathology	Macroscopic:- - mainly in upper pole. - C/S: area of Hg & necrosis, no capsule Microscopic:- - mixed tumour (epith. & C-T) arise from embryonic tissue. spread:- - Direct:- to adjacent structures. - Blood:- to lung (canon ball)? - Lymph:- (less common) to paraortic LN staging:- - stage I:- limited to kidney (complete resection) - II:- extend beyond kidney (but complete Resect.) - III:- extend to abdomen (residual tumor) - IV:- distant metastasis - V:- bilateral tumour.	- mainly in upper pole. & fibrosis - C/S: yellowish @ area of Hg & necrosis - adenocarcinoma, highly vascular. arise from PCT (proximal conv. tubule). - Direct spread: to adjacent structures - Lymph:- to paraortic LN & Virchow's LN - blood:- to lung (canon ball) or L.B.B. stage I:- confined to kidney. II:- " to Gerota's fascia III:- involves renal vein ± LN IV:- metastasis (L.L.B.B.). TNM staging:- T₁ = tumour < 7cm T₂ = > 7cm limited to kidney T₃ = extended to major veins T₄ = beyond Gerota's fascia, as adrenal T_{1a} → < 4 cm T_{1b} → 4-7 cm T_{3a} - renal V. T_{3b} - IVC infradiaph. T_{3c} - IVC supradiaeph. N₁ = node < 2cm N₂ = 2-5 cm or multiple < 2 N₃ = > 5cm M₀ = No mets M₁ = distant metastasis
Clinical Picture	90% presented @ abdominal mass 60% @ HTN (Renin). 50% @ pyrexia - others:- pain, hematuria, vomiting, wt loss, aniridia (1%) - s/s of metastasis → (pulmonary) - D/D:- hydronephrosis, PCK, RCC, neuroblastoma (most common ca. in infant)	50% - hematuria (gross, painless, total). 40% - renal pain (capsule stretch, clot). 30% - renal mass (irregular, hard). (Poor Prognostic → wt loss, anemia, asthenia, bone pain) - Non-typical:- HTN, 2nd varicocele, night sweat - Paraneoplastic syndrome → ↑ Ca⁺⁺ (5%) (PTH-like or due to bone mets), amyloidosis, polycythemia (erythropoietin), stuffer synd.

	Wilms' tumour	R.C.C.
Investig.	- U/S, CT. - IVU, laboratory invest.	- U/S, CT, MRI (for vascular invasion) - FNA to confirm. - U/A, U/E/C, CBC, LFT.
Treatment	- Nephrectomy, followed by radiotherapy. - partial nephrectomy if it is a bilateral disease. - palliative ttt if unoperable.	- radical nephrectomy (kidney, adrenal, fat) ^{or LN} - renal sparing surgery → partial nephrectomy for <4cm tumour, solitary kidney and bilateral disease. - immunotherapy :- interferon α / interleukin 2. - for unfit pt → embolization of renal a. (autonephrectomy), palliative radiation for bone mets.
Prognosis	- 90% long-term survival. - less good prognosis if older children.	- staging is the most important prognostic factor - 5% survival rate is 60%.

NB: Nerve roots in micturition: S2,3,4 (S2,3,4 keeps urine off the floor).



UROLOGY TRAUMA

⇒ Urinary tract injury accounts for 10% of all injuries, the kidney is the most common ≈ 50%.

* Types of trauma :-

1. blunt trauma → RTA, fall.
2. penetrating trauma →
 - iatrogenic.
 - gunshot.
 - stab wound.

- Renal trauma :- mainly due to blunt trauma 80% ($\sigma:\eta \rightarrow 3:1$)
- Bladder trauma :- " " " blunt " 70%
(90% ass. & pelvic *, 50% * in pubic bone).
- Ureteral trauma :- mainly due to iatrogenic as in Gynae operation.
- Urethral trauma :- mainly " " pelvic * (blunt).

* Clinical Picture :-

- Renal inj. :- Pain in flanks, contusion, hematuria, shock, oliguria & urine retention (clot).
- Bladder inj. :- abdominal pain, tenderness, hematuria (90%), shock, inability to void urine, peritonitis.
- Ureteral inj. :- asymptomatic, loin pain, if bilateral → anuria or oliguria
- Urethral inj. :- urine retention, bleeding per urethra, distended bladder, high riding prostate on DRE, ^{perineal} hematoma.

* Investigations :-

- ⇒ Urine analysis (UA) → hematuria (degree not correlate ^{ing} & severity).
- ⇒ U/S, CT scan, CTU, plain X-ray (KUB), IVU, → urine extravasation
- ⇒ RUG (retrograde urethrography) for all pt & suspected urethral inj if pt has bleeding per urethra.

RENAL TRAUMA

* Classifications :-

- Grade I :- contusion / hematoma.
- " II :- < 1cm cortical laceration without urine extravasation.
- " III :- > 1cm " " " " " "
- " IV :- corticomedullary " with " " "
- " V :- shattered kidney or pedicle avulsion.

(I, II, III → minor, IV, V → major)

(Staging not necessary correlate w C/P).

* Treatment :-

- = microscopic hematuria + minor inj. → no hospitalization.
- = macroscopic " + grade I, II → conservative (bed rest, analgesia, antibiotic, repeat CT).
- = Surgery indicated in class IV, V → stitching or nephrectomy

* Complications :-

- HTN, perinephric abscess, hydronephrosis, nephropptosis, renal artery aneurysm, renal atrophy.

BLADDER TRAUMA

* Classification :-

- I - contusion → no urinary extravasation.
- II - Extraperitoneal rupture :- (80%) "commonest" ass. w ^{no desire to micturate} ~~pelvis~~ → anterior wall.
- III - Intra peritoneal rupture :- (20%) blow on distended UB → post. wall. _{has desire to mictur}

* Treatment :-

- = for contusion → catheter (Foley) until hematuria resolves.
- = " extraperit. inj → non-op. (Foley), may need surgery → (failed conservative)
- = " intraperit. inj. → surgical repair & suprapubic catheter.

URETERAL TRAUMA

* treatment :-

- restore ureter by oblique stitching & put double J catheter for 2 wk & put tube drain.

NB :- commonly iatrogenic during hysterectomy or endoscopy.

URETHRAL TRAUMA

* classification :-

- Posterior urethra inj. :- (commonest) → in prostatic & membranous.
- Anterior " " :- → in bulbar or penile parts.
mainly blunt "straddle injury".

* Treatment :-

- Urethroplasty = end to end anastomosis, if big gap take flap.
- Complication → Stricture.

PENILE TRAUMA



* **Fracture Penis** → by sudden angulation of erected penis due to blunt trauma (usually vigorous sexual intercourse) common in 15-20 yrs.

* **C/P** → Pain, bruises of penis, deformed shape.

* **t/t** → evacuate hematoma & repair defect. open under corona degloving penis wash clot w/ saline stitch = absorbable

* If pt comes late → fibrosis → impotence.

URINARY STONES

UROLITHIASIS

unstable summary

* Incidence :-

- affect 3% of people , male:Female 3:1 , age 30 - 50 yrs.
- recurrence 10% , up to 60% (stone formers)

* Risk factors :-

- 1 = metabolic errors (1st stones) due to
 - Calcium stones → hyperparathyroidism, sarcoidosis, histoplasmosis, tumour lysis syndrome, vit D intoxication.
 - uric acid stones → gout, tumour lysis syndrome.
 - cystine stones → hereditary cystinuria.
 - xanthine stones → " xanthinuria
- 2 - infection (2nd stones) :-
 - usually phosphate stone, more in females.
 - infection → alkaline urine (phosphate), acidic urine (other stones) ^{= oxalate/urate/cystine} and provide nucleus for stone formation.
- 3 - Life style → ↑ by sedentary work (Dr), excess vit c, hot weather, dehydration, diet → calcium stone by milk & products ^{its}, oxalate by tomatoes, mango, spinach, urate by liver, sardines, salmon
- 4 - medications → loop diuretics, acetazolamide.
- 5 - medical conditions → UTI, IBD, DM, gout, obesity
- 6 - congenital anomalies as horseshoe kidney

* Pathogenesis (formation) :-

- 1 - supersaturation of solutes
- 2 - stasis & obstructions
- 3 - nucleus → (nidus)

* Types of stones *

	oxalate	Phosphate	urate	cystine	xanthin
incidence	60%	15-25%	10%	1-3%	v. rare
chemistry	Ca-oxalate	- Ca-phosphate or - triple (Ca-ammonium magnesium phosph)	Uric acid	non-essential amino acid	xanthine
No./size	single/moderate	single or multiple may large (staghorn)	small & multiple	small & multiple	small & multiple
surface	spiky	smooth	smooth	smooth	smooth
colour	brown or black by blood (oxalate white)	dirty white	yellow to brown	yellow to green	yellow
consistency	very hard	chalky, friable	hard	very hard	soft
X-ray	radio-opaque	opaque	lucent	opaque	lucent

* Clinical Picture *

- 1 - silent (asymptomatic)
- 2 - Pain $\rightarrow$ flank non colicky (kidney) or ^{sever sudden} colicky (ureter) radiate to groin
- 3 - nausea, vomiting, hematuria $\pm$ fever (infection).

* Complications *

- 1 - obstruction, migration, hematuria, infection, (malignancy if in bladder)
- 2 - hydronephrosis, hydroureter, acute retention, anuria.

* Investigations *

- urine R/E, C/S, CBC, KUB (plain xray)
- US, CT scan, IVU (not in acute), cystoscope

* Treatment :-

- A - conservative :- (stone < 0.5 cm).
- B - ^{intervention} ~~minimally invasive~~ :- URS, PCL, ESWL
- C - open surgery :- only in 5%

A) Conservative :-

- indicated in small stone (< 0.5 mm) ^{pass spont. in $> 90\%$} , uncomplicated.
- analgesia (voltaren), antibiotic, $\uparrow$ fluid intake $\pm$ diuretic, MET (medical expulsion therapy) $\rightarrow$ α blockers (relax trigone)
IV fluid if vomiting $\rightarrow$ Ca^{++} channel blockers (adalat)

B) Intervention :-

① ESWL (extracorporeal shock wave lithotripsy) :-

- = for kidney stone < 2 cm or ureter < 1 cm / insert double J catheter before it
- = complications :- hematuria, perinephric hematoma, UTI, Pain, Steinstrasse (street) stones in ureter.
- = contraindicated if :- pregnancy & uncontrolled coagulopathy (absolute)
 - febrile pt, large stone, single kidney, distal obst

② PCNL (percut. nephrolithotomy) :-

- = for stone kidney > 2 cm or ureter > 1 cm
- also indicated for staghorn, PUJ obst., cystine stone, anatomical anomalies, failed ESWL
- = complications :- bleeding, infection, A-V fistula, injury of colon or others, residual stone

③ Endoscopy :-

A) URS :- ureteroscope :-

- for ureter stone < 1 cm $\rightarrow$ remove or laser or push to pelvis
- it is pt line with ESWL (σ ESWL, ϕ URS)
- endoscope can do $\rightarrow$ lithotripsy, meatotomy, debris basket

B) cystoscopy & litholapaxy :-

- for bladder stone < 2 cm $\rightarrow$ crushing & lavage

④ open surgery :-

- for bladder stone > 2 cm or multiple.
- also pyeloplasty, partial nephrectomy, nephrolithotomy, pyelolithotomy, ureterolithotomy and cystolithotomy (UB)

UTI - Urinary tract inf.

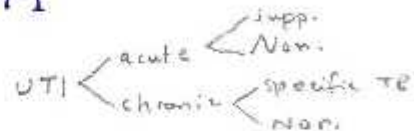
unila
summary

* Definition & incidence :-

- It is infection of urinary tract, more in female (close to anus short wide urethra)
- 2nd commonest infection after URTI

in old ♂ = ♀ (BPH)

* Classification :-



- According to duration → acute or chronic
- " " site → upper UTI (kidney), lower UTI (UB, .. etc)
- " " organism → specific (TB), non specific (E-coli 85%)
- " " complications → uncomplicated (normal structure & function) & complic. UTI
- " " process →
 - isolated UTI (last UTI ➤ 6 months)
 - recurrent UTI (reinfection^{95%} or bacterial resist.)
 - unresolved UTI.

* Route of infection :-

- 1- ascending (commonest) through urethra.
- 2- descending :- from kidney down.
- 3- haematogenous (uncommon).
- 4- Direct (lymphatic) :- from appendicitis

* Organism is usually E. coli (85% of community acquired, 50% of hospital^{acquired})
 others → Kleibisila, Proteus, Staph, TB, chlamydia

* Predisposing factors :- (RF)

1. Stagnant urine → infrequent voiding, obstruction (PUV, VUR, BPH) - & PCK
2. Foreign body → catheter, stone ... etc
3. ↓ resistance → e.g DM, malignancy, steroids. -- etc.
4. others → e.g cong. anomalies. fistula. female.

NB:- Pathogenesis of infection include :-

route of infection
 organism
 predisposing (Risk) factors

* Clinical Picture UTI :-

1. Storage s/s $\rightarrow$ frequency, urgency, dysuria. (LUTS) ^{lower UT symptoms}
2. Voiding s/s $\rightarrow$ hesitancy, post voiding dripping
3. Others $\rightarrow$ suprapubic pain, haematuria, foul smelling urine.
- Pyelonephritis $\rightarrow$ severe s/s (fever, chills, flank (CVA) tenderness) ^{costo-vertebral angle}
- Pyonephrosis $\rightarrow$ classic triad (fever, swelling & anaemia) ^{hectic}

* Investigations :-

- Urine R/E ($\uparrow$ WBC $\pm$ nitrites $\pm$ haematuria), urine C/S (midstream or suprapubic)
- CBC, ESR, CRP, U/E/C
- KUB, US, IVU, CT if indicated. (MRU, CTU)

* Treatment of UTI :-

- good hydration, AAA (antibiotic, antipyretic, analgesia) ^{ciprof.} $\geq 3L/d$ + IV fluid
the AB given IV if acute pyelonephritis & any abscess & draining.
- Drainage of pus in case of pyonephrosis (nephrostomy tube) and renal & peri-nephric abscess
- treat the underlying cause (stone, anomalies etc)
- nephrectomy may needed if kidney not functioning due to pyonephrosis, ch. pyelonephritis, TB etc

* Genito-Urinary TB :-

- Always 2^{ry}, rare in children, usually unilateral in kidney.
- In kidney may $\rightarrow$ pyonephrosis, abscess, calcification, HTN.
- In ureter $\rightarrow$ mostly in lower ureter
- In UB always around ureteric orifice $\rightarrow$ hydroureter, hydronephrosis
- In testis & epididymis can cause ulcer at back of scrotum
- ttt $\rightarrow$ ant: TB drugs & may need surgery.

URINARY RETENTION

* Definition :-

- ⇒ Inability to pass urine [urinary incontinence = inability to control urine]
- ⇒ Common in old male (BPH common cause).
- ⇒ In young male commonest cause acute prostatitis.

* Aetiology :-

1. Local causes :- urethral obstruction

- Prostatic → BPH, cancer.
- U. Bladder → stone, cancer, neurogenic bladder.

2. General causes :- spinal cord injury, coma, post operative. (anaesth.)

- drugs → anticholinergic, opiates, antidepressant and amphetamines.

* Types :-

1. Acute retention :- (medical emergency) → ^{suprapubic} severe pain, ^{sudden} anuria

O/E → UB palpable & tender / normal UB volume

2. Chronic retention :- gradual, may asymptomatic

O/E → UB palpable, ↑ UB volume & detrusor hypertrophy followed by atony (late).

* Investigations :-

- ⇒ CBC, electrolytes, (U/E/C), U/A & urine C/S.
- ⇒ KUB, US, uroflowmetry [maximum flow rate $\left\{ \begin{array}{l} \text{♂ } 13-15 \text{ ml/sec.} \\ \text{♀ } 17-20 \text{ ml/sec.} \end{array} \right\}$ cystoscope]

* Treatment :-

- 1- catheterization
- 2- treat underlying cause.

URETHRAL STRICTURE

↓ urethral calibre due to scar, M > F

* Aetiology :-

- (1) congenital →
- (2) Traumatic → (commonly iatrogenic (catheterization), FB, trauma) ^{circum}
- (3) infection → long term catheter, STI (sexually transmitted inf.)